US DEPARTMENT OF ENERGY
BUILDING STANDARDS AND GUIDELINES PROGRAM
2nd Quarter 1999 Volume 8, Issue 2

Setting the Standard

New ASHRAE Standard 90.1 Approved for Publication

After ten years of development, three public reviews, and over 80,000 comments, the new ASHRAE Standard 90.1 will soon be available. On June 18, 1999 at ASHRAE's Seattle Annual Meeting, members of the Standing Standard Project Committee (SSPC) 90.1 approved the American Society of Heating, Refrigerating, and Air-Conditioning Engineers/Illuminating Engineers Society of North America (ASHRAE/IESNA) Standard 90.1-1989R for publication.

The new Standard 90.1 was subsequently approved by all of the oversight committees within ASHRAE, and received Board of Directors approval on June 24, 1999.

What's New in Standard 90.1-1999?

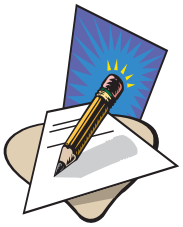
- Written in mandatory, enforceable language suitable for code adoption
- Both IP and SI units included in the Standard
- Expanded climate data to accommodate international locations
- Expanded scope to include coverage of alterations and additions to existing buildings
- Envelope prescriptive requirements summarized in a single table for any climate location
- True prescriptive option for building envelope requirements
- Default U-factor tables for envelope assemblies to reduce calculations
- Simplified option for complying with mechanical requirements suitable for smaller buildings
- New mechanical equipment types added
- Enhanced efficiency requirements for most mechanical equipment
- Mechanical section significantly reorganized for simplicity
- Revised lighting power density tables
- "Use it or lose it" allowance for decorative lighting
- Significantly revised Energy Cost Budget (ECB) section
- Requirement for compliance supplement to reduce "gaming" in the ECB section

The ASHRAE Board approval is subject to a 45-day appeal period during which appeals of the Board action my be made. IESNA's Board of Directors is expected to approve the standard at their Annual Meeting in New Orleans in August 1999. The new document, entitled "Energy Standard for Buildings Except Low-Rise Residential Buildings" will be published as ASHRAE/IESNA Standard 90.1-1999. Copies of the new Standard could be available from ASHRAE by the Winter Meeting in Dallas, Texas, in February 2000.

The new Standard 90.1 contains extensive revisions to all sections of the Standard, and will completely replace Standard 90.1-1989 when the 1999 version is published. Changes to the new Standard include both format and technical content changes. Of special interest to users of the Standard are the facts that the document is written in mandatory, enforceable language and that the Standard now applies to alterations of and additions to existing buildings. Other features of interest include extensive modification of the envelope requirements and new lighting power allowances (see sidebar for specific changes). Accompanying the new Standard will be a User's Manual (with additional information on using the Standard) and ASHRAE Guidelines (for users interested in going beyond the standard in terms of energy efficiency). The User's Manual will be available at the same time as the Standard, and the Guideline will be published when completed by the project committee.

Inside this issue . . . . .

Letters to the Editor



I am happy to see a dialogue emerge about the role of the Federal government in developing and promoting more stringent energy codes, and in developing code compliance tools. In regards to Mr. Barrett's response [1Q1999:8(1)] to my earlier letter, I need to set the record straight. REM/Rate™ has been developed for HERS providers and includes many special features for this audience. However, its sister program—REM/Design™—is a rigorous, low-cost program designed for use by home builders, designers, energy consultants, weatherization contractors, and code officials. REM/Design has automated code compliance analysis capability, both prescriptive and performance paths, for MEC 1992, 1993, 1994, IECC 1998, and ASHRAE 90.2. The price for REM/Design is $297.00 and has no annual license fee or rating/use fee. A custom EEBA version is available through the EEBA bookstore for $150.00 for EEBA members. Therefore, AEC is being responsive to the concerns raised by Mr. Barrett, and we will continue to be responsive to the marketplace. However, it is hard to compete in a marketplace where the Federal government is the competition and they provide the compliance tools for free. Again, I reiterate my position that the Federal government should help create a market for energy code compliance tools by encouraging state and local governments to adopt building energy codes, but should **not** develop and market code compliance tools. One only has to look at Title 24 in California to know that the private sector is able and prepared to meet marketplace demands for compliance services and tools.

Sincerely,

Michael J. Holtz, A.I.A.
Architectural Energy Corporation, Boulder, Colorado

Thanks for printing Michael Holtz's letter [3Q1998:7(3)]. I agree with Mike that DOE should not be "in the software" business when it comes to producing finished products. However, I think there is an important role for DOE that Mr. Holtz is overlooking. Specifically, I'm referring to the job of creating a public "domain" software foundation that can then be licensed by private firms who then develop the graphical user interface (GUI) and sell and support their software. I'm convinced that this is a necessary role for DOE to play because of my involvement in ASHRAE's SPC 140SMOT which is developing a standard method of test for simulation software. Incredible as it seems, the HVAC industry has yet to develop a complete set of analytical "benchmark tests" for simulation software that will give the user some assurance that the software they are using works.

Without some sort of standard software the users of compliance checking software have no way of knowing if software from Company A is more or less accurate than software from Company B, other than what is printed in a company's brochure. Therefore I would recommend that DOE spend its money on "standard software engines," such as DOE-2 that can then be licensed to private software developers who then add GUIs and/or enhancements. In my mind, this is the only way that users can be assured of credible results from their software.

Sincerely,

Jeff S. Haberl, Ph.D., P.E.
Energy Systems Laboratory, Texas A&M University, College Station, Texas

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Letters for the next issue of *Setting the Standard* must be received by November 1. Send your letters to:

Andrea Murphy, Editor—*Setting the Standard*

Pacific Northwest National Laboratory
PO Box 999, MS K5-16 Richland, WA 99352
Fax: (509) 375-3614 E-mail: Andrea.Murphy@pnl.gov

Correction – The article "Proposed ICC Code Changes Reviewed at Spring Hearings" 1Q1999:8(1)] incorrectly reported the phone number for contacting the International Code Council, Inc. (ICC). The correct phone number is (703) 931-4533. More information about the ICC code development process is also available at *www.intlcode.org*.

Second National Conference on State Building Energy Codes Draws Participants From Around the World

More than 170 participants from around the U.S. and from as far away as Singapore and Australia gathered in Tacoma, Washington, July 13-14 for the National Conference on State Building Energy Codes. This second annual conference, sponsored by the U.S. Department of Energy (DOE), Building Standards and Guidelines Program (BSGP), brought together staff from more than 30 state energy organizations, as well as energy code consultants, product suppliers, and representatives from utilities, energy-efficiency advocacy groups, model code organizations, the national laboratories.

The first day's keynote address was given by Mark Ginsberg, U.S. DOE, Deputy Assistant Secretary, State and

See National Conference, Page 3

DOE Introduces Two New Tools for Commercial Code Compliance

Two new software tools for checking commercial building energy code compliance with ASHRAE Standard 90.1-1989 are anticipated for release in Fall 1999 from the U.S. Department of Energy's (DOE) Office of Building Technology Assistance. COM*check-EZ*™ Version 2.0 is a major upgrade to the energy compliance software for simple commercial buildings first introduced in early 1997. COM*check-Plus*™ Version 1.0 is a new piece of software offering simplified whole-building compliance for any simple or complex commercial building.

What's New in COM*Check-EZ*™ 2.0

- Advanced Help system
- Applicable to all HVAC types
- Mechanical "Wizard" prompts user to enter basic mechanical systems and equipment, then displays customized list of applicable requirements
- Improved output reports
- Support for Chapter 7 of the 1998 International Energy Conservation Code (IECC) and state-specific codes is planned

COM*check-Plus*™ 1.0

- Automates and standardizes whole-building performance compliance process
- *Building Creation Wizard* creates description of building, ready for simulation, with minimal input—bridges the gap between users who need a quick determination of compliance with Standard 90.1 and users who want to perform a detailed commercial building energy simulation
- Compliance reports contain checklists of observable building features warranting verification
- Rules and assumptions used by the program are contained in text files; major changes can be made to the compliance process by altering only the rule set without changing the program itself

How Do I Get a Copy?

Both new COM*check* products are expected to be available in Fall 1999. They will be available for free downloading from DOE's Building Standards and Guidelines Program (BSGP) web site at *www.energycodes.org*, or for a nominal fee from the BSGP Hotline at (800) 270-CODE. DOE is eager for feedback on these products and to work with users to create improved materials that facilitate effective code implementation.

National Conference

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Community Programs. Marc Sullivan, Director of Strategic Planning, Seattle City Light, was the keynote speaker on day two. He discussed why energy efficiency codes are more important than ever, in light of utility restructuring nationwide that has utilities cutting energy conservation programs and a booming economy that is adding thousands of new buildings to the nation's building stock.

The second day of the conference included four workshop sessions offering participants choices on workshops covering a variety of topics, including recent code compliance and implementation case studies, ways to leverage energy code adoption, implementation, and enforcement by linking to other energy efficiency programs, what the next level of building efficiency codes might include and what new technologies and products are on the horizon, and partnering with code officials for more successful implementation. State representatives were invited to share success stories and challenges in the "Parade of States" session. The States Roundtable for Code and Energy Officials was held on the day immediately following the conference.

Pre-conference activities included a Technical Issues Forum with national and state energy experts to examine key performance issues, and tours of a Super Good Cents energy-efficient manufactured home and the University of Washington Tacoma Campus, which has several renovated older buildings and state-of-the art lighting and HVAC.

Plans for next year's conference are underway. Details will be published in future issues of *Setting the Standard*. For more information call the BSGP Hotline at (800) 270-CODE.

Nevada Launches Effort to Improve Building Energy Code Implementation

With funding provided through a 1997 DOE State Energy Programs (SEP) Special Projects codes grant, the Nevada State Energy Office (NSEO) has launched an innovative program to improve residential energy code implementation. The effort involves three tiers: 1) educating code officials and housing industry professionals on the provisions of the Model Energy Code (MEC) and marketing advantages for energy efficient homes; 2) having local building departments recognize home energy ratings as a compliance option; and 3) securing preferred financing for homes meeting or exceeding the 1995 MEC.

The web site "Nevada Energy Efficient Housing Connection" (*www.natresnet.org/nevada/*) was launched to cost-effectively educate building code officials, builders, and other housing industry professionals on the requirements of the MEC and the benefits of energy efficient homes. The web site presents complete and concise information on the MEC and MEC*check*™, as well as market-based incentives that can be accessed to support effective builder compliance with the MEC.

See Nevada Launches Effort, Page 4

Next-Generation FEDCOM Ready for "Prime Time"

Notice of Proposed Rulemaking (NOPR) Due Out This Fall

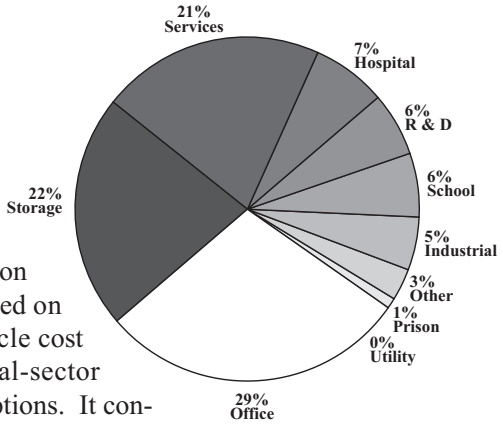
The existing standard for Federal commercial buildings appears in 10 CFR 435, Subpart A, "Voluntary Performance Standards for New Commercial and Multi-Family High Rise Residential Buildings." To bring the Federal- and private-sector code formats closer together, DOE is revising 10 CFR 435 via formal rulemaking to reflect the codified version of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc./Illuminating Engineering Society of North America (ASHRAE/IESNA) Standard 90.1-1989. Once this update is approved as a Final Rule, the requirements for commercial buildings will be removed from 10 CFR 435 and placed in a new section, 10 CFR 434, "Energy Code for New Federal Commercial and Multi-Family High-Rise Residential Buildings."

The U.S. Department of Energy (DOE) has developed a more progressive Federal Commercial Building Energy Standard, the "Next-Generation FEDCOM." The new standard is designed to help Federal agencies meet the requirements of Executive Order 12902 that sets a Federal building energy savings goal for 2010.

The Next-Generation FEDCOM includes energy efficiency requirements for the building envelope; heating, ventilating, and air-conditioning (HVAC) systems and equipment; service water-heating systems and equipment; electrical distribution systems and equipment for electric power; lighting; and energy management systems. It covers new Federal commercial building designs as well as major renovations, and alterations to the HVAC or service water-heating systems within existing buildings. The various energy efficiency criteria were developed using the same methodology used by ASHRAE to develop the revised Standard 90.1-1989 (BSR/ASHRAE/IESNA Standard 90.1-1989R) but with Federal economic assumptions.

The U.S. Department of Defense, the General Services Administration, the Veteran's Administration and the U.S. Postal Service account for roughly 87% of the existing U.S. Federal commercial building stock. Most Federal housing is covered by DOE's Federal Residential Building Energy Standard (10 CFR 435, Subpart C). Federal commercial buildings cover the following building types:

- Office 29%
- Storage 22%
- Services 21%
- Hospital 7%
- Other 21%



The technical requirements in the Next-Generation FEDCOM are based on minimum life-cycle cost criteria and Federal-sector economic assumptions. It contains more stringent envelope requirements than those in the current standard because they are based on building energy costs and Federal-sector cost information. The new standard also contains more stringent efficiency requirements for many types of HVAC and service water-heating systems and equipment. More progressive electrical metering and rating requirements for building power distribution systems are also included. The lighting requirements in the new standard are based on the latest information on lighting levels and technologies and address lighting quality in design. The energy cost budget (ECB) section gives Federal agencies an alternative way to show compliance using trade-offs to enhance building design energy efficiency.

The Next-Generation FEDCOM is easy to use and enforceable. It closely resembles the format of the revised ASHRAE Standard 90.1. The new standard is scheduled for publication in the Federal Register as a Proposed Rule in the fall of 1999 and as a Final Rule in the summer of 2000.

Update on the Status of State Energy Codes

The hustle and bustle of energy codes is being felt throughout America! This May, **Nebraska** adopted the 1998 International Energy Conservation Code (IECC) for all state-owned and state-funded buildings, making it the first state to adopt the latest energy efficient building code for new construction. Effective January 1, 2000, all new or completely renovated state buildings must comply with the minimum efficiency requirements of the 1998 IECC. The law also extends minimum energy efficiency requirements to all other new buildings that are built using public funds, such as low- and moderate-income housing and local government buildings. Moreover, the new law directs the State Energy Office to provide plan reviews and other technical assistance necessary to carry out the requirements of this law. Although all other new construction must still comply with ASHRAE Standards 90.1A-1980 and 90B-1975, the jump to the 1998 IECC for state buildings is a great step forward for Nebraska in its efforts to save energy and help the environment.

States that recently upgraded their energy codes for all new residential construction include **Connecticut** and **Wisconsin**. Effective May 1, 1999, Connecticut upgraded its residential code to the 1995 MEC as part of its adoption of the 1996 Building Officials and Code Administrators (BOCA) national building code. Previously, Connecticut had a state-specific code that was weaker than the 1992 MEC. Its commercial code remains the Energy Policy Act (EPAct)-mandated ASHRAE 90.1. The state is holding energy code training for building officials this summer. Wisconsin's Uniform Building Code went into effect May 1, 1999, which strengthened the energy efficiency requirements of its residential energy code, based on the 1995 MEC. The state has trained over 2,500 builders, subcontractors, and code officials on the new residential energy code for one-and two-family dwellings and over 4,000 design professionals and contractors have been trained over the past two years on the current commercial code. Wisconsin also has a state version of MEC*check*™ (WIS*check*) which is available on-line from the U.S. Department of Energy's Building Standards and Guidelines Program web site at *www.energycodes.org*.

Meanwhile, the following states are reviewing the 1998 IECC or the 1995 MEC for possible adoption this year.

- **New York**: Governor Pataki's Budget Bill includes uniform building code legislation calling for the mandatory statewide adoption of the 1998 IECC. The bill also allocates funding for code training and implementation and should be heard this summer.
- **Pennsylvania**: The Senate of the Pennsylvania Legislature is considering a bill to adopt the 1996 BOCA codes, which include the 1995 MEC and ASHRAE 90.1. A companion bill has been introduced in the House. Also, the City of Philadelphia, which currently uses the 1995 MEC, is considering upgrading its energy code to the 1998 IECC.
- **Arizona**: On May 15, Governor Hull signed into law a bill (now Chapter 336) which establishes an energy codes study committee to review the 1998 IECC and relevant state energy codes to determine a beneficial energy code for use statewide. The committee must submit its findings to the Governor and legislature by December 1, 1999.

For more information on energy codes and state activities, or to receive a free copy of the Building Codes Assistance Project (BCAP) newsletter, *Status of State Energy Codes*, contact BCAP at *bcap@ase.org* or go on-line at *www.crest.org/efficiency/bcap.*

Nevada Launches Effort

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A unique feature of the web site includes the comparisons prepared by the Pacific Northwest National Laboratory on the differences between the 1992 and 1993 and the 1993 and 1995 MECs. The site also includes a page explaining the linkage between effective code implementation and market-driven programs such as home energy ratings. The site has been publicized throughout Nevada with news releases, and has been very popular. It received 587 visits during the first month it was put on-line.

Recognizing that the market can be a very important force toward effective implementation of a building energy code, the NSEO has been working with local building departments to recognize home energy ratings as an option for demonstrating compliance to the MEC. To date, the building departments in Carson City, the City of Reno, the City of Sparks, and Washoe County have agreed to incorporated ratings from Energy Rated Homes of Nevada as a compliance option in their local energy codes.

To create a market incentive for builders to meet the 1995 MEC, the NSEO and Energy Rated Homes of Nevada have been working with mortgage lenders to offer preferred financing for homes that show documented compliance with the MEC. In April, the Carson City and Reno branches of GMAC Mortgage agreed to offer a $300 discount on closing costs for the purchase of homes meeting the 1995 MEC through an Energy Rated Homes of Nevada home energy rating.

For more information, contact Dave McNeil, NSEO grant project manager, at *dmcneil@govmail.state.nv.us*, or Steve Baden of Western Residential Energy Services, developer of the "Nevada Energy Efficient Housing Connection web site, at *resnet@earthlink.net*.

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BUILDING STANDARDS AND GUIDELINES PROGRAM

A.L. Murphy (address corrections only)
Pacific Northwest National Laboratory
PO Box 999—MSIN K5-16
Richland, Washington 99352

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Calendar

September 12-17, Joint Annual Conference of BOCA, ICBO, and SBCCI, St. Louis, Missouri.
Contact: ICBO, (800) 284-4406; see also *www.icbo.org*.

October 22-23, JLC Live! Construction Business and Technology Conference and Expo, Las Vegas, Nevada.
Contact: Journal of Light Construction, (800) 261-7769; see also *www.jlclive.com/*.

November 4-7, Energy Efficient Builders Association (EEBA) Conference and Expo, Baltimore, Maryland.
Contact: (651) 268-7589; see also *www.eeba.org*.

November 10-13, National Conference of States on Building Codes and Standards (NCSBCS) Annual Conference, San Antonio, Texas.
Contact: NCSBCS, (800) 362-2633; see also *www.ncsbcs.org*.

November 16-18, Build Boston, Boston, Massachusetts.
Contact: (800) 996-3863; see also *www.buildboston.com*.

January 14-17, 2000, National Association of Home Builders (NAHB) International Builders' Show and International Commercial Construction Exposition (ICCON), Dallas, Texas.
Contact: NAHB, (202) 861-2111; see also *www.nahb.com*.

February 5-9, 2000, ASHRAE Winter Meeting, Dallas, Texas.
Contact: ASHRAE, (404) 363-8400.

Setting the Standard *is published three times a year for the U.S. Department of Energy by the Building Standards and Guidelines Program at the Pacific Northwest National Laboratory. Its purpose is to encourage information exchange among building industry professionals and organizations, state and local code officials, and researchers to facilitate timely development and early adoption of the building energy conservation standards. Send comments and contributions to Andrea Murphy at Pacific Northwest National Laboratory (Andrea.Murphy@pnl.gov).*

• Editor: Andrea Murphy • Hotline: (800) 270-CODE • Internet: http://www.energycodes.org